THE INVENTION CLAIMED IS

1. An electrode array for connection to tissue containing cells, comprising:

a substrate composed of a polymer that has the ability to conform to various shapes of said tissue, and

electrodes embedded in said substrate for contacting said tissue.

2. The electrode array for connection to tissue containing cells of claim 1, including conductive leads connected to said electrodes.

3. The electrode array for connection to tissue containing cells of claim 2, wherein said polymer is flexible.

4. The electrode array for connection to tissue containing cells of claim 2, wherein said polymer is stretchable.

5. The electrode array for connection to tissue containing cells of claim 2, wherein said polymer is poly(dimethylsiloxane).

6. The electrode array for connection to tissue containing cells of claim 1, wherein said electrodes for contacting said tissue are useful for stimulating said cells.

7. The electrode array for connection to tissue containing cells of claim 1, wherein said conductive leads are connected to a device for transferring a visual image signal.

8. The electrode array for connection to tissue containing cells of claim 2,

wherein said electrodes for contacting said tissue are useful for stimulating said cells and said conductive leads are connected to a device for transferring a visual image signal.

9. The electrode array for connection to tissue containing cells of claim 8, wherein said tissue is retina tissue.

10. The electrode array for connection to tissue containing cells of claim 9, wherein said substrate is composed of a flexible polymer and has the ability to conform to the shape of said retina tissue.

11. The electrode array for connection to tissue containing cells of claim 10, wherein said conductive leads and said electrodes transmit said visual image signal to said cells in said retina tissue.

12. The electrode array for connection to tissue containing cells of claim 11, wherein said cells are retinal neurons.

13. The electrode array for connection to tissue containing cells of claim 1, including micromachined points, barbs and/or hooks or tacks in said electrodes embedded in said substrate for contacting said tissue.

14. The electrode array for connection to tissue containing cells of claim 1, wherein said polymer is an elastomer.

15. The electrode array for connection to tissue containing cells of claim 1, wherein said polymer is an elastomer that is flexible.

16. The electrode array for connection to tissue containing cells of claim 1, wherein said polymer is liquid silicone rubber (LSR).

17. The electrode array for connection to tissue containing cells of claim 1, wherein said elastomer is poly(dimethylsiloxane).

18. An electrode array for an artificial vision system for receiving an image signal representing an image and transferring said image signal to a retina, comprising:

an electrode array including a polymer substrate, said polymer substrate being flexible and stretchable and having the ability to conform to the shape of said retina, and

electrodes embedded in said polymer substrate.

19. The artificial vision system of claim 18, wherein said electrodes embedded in said polymer substrate contact said retina and said signal representing said image stimulates cells in said retina.

20. The artificial vision system of claim 18, wherein said conductive leads and said electrodes transmit said signal representing said image to said cells in said retina.

21. The artificial vision system of claim 20, wherein said cells are retinal neurons.

22. The artificial vision system of claim 18, wherein said device for transmitting a signal representing said image is a video camera.

23. The artificial vision system of claim 18, wherein said electrodes include micromachined barbs and/or hooks or tacks for anchoring said implant to said retina.

24. The artificial vision system of claim 18, wherein said polymer is poly(dimethylsiloxane).

25. An electrode array for an artificial vision system for receiving an image signal representing an image into an eye and to a retina, comprising:

an implant connected to said retina consisting of a flexible polymer substrate, said flexible polymer substrate being flexible and stretchable and having the ability to conform to the shape of said retina, and

electrodes embedded in said elastomer substrate.

26. The artificial vision system of claim 25, wherein said electrodes embedded in said flexible polymer substrate contact said retina and said signal representing said image stimulates cells in said retina.

27. The system of claim 25, including conductive leads connected to said electrodes wherein said conductive leads and said electrodes transmit said signal representing said image to said cells in said retina.

28. The system of claim 27, wherein said cells are retinal neurons.

29. The system of claim 25, wherein said device for transmitting a signal representing said image is a video camera.

30. The system of claim 25, wherein said electrodes include micromachined barbs and/or hooks or tacks for anchoring said implant to said retina.

31. The system of claim 25, wherein said flexible polymer is poly(dimethylsiloxane).

32. A method of processing an electrode array for connection to tissue containing cells, comprising the steps of:

implementing initial processing steps on a polymer substrate that has the ability to conform to various shapes of said tissue,

plating or otherwise depositing a conductive material on said polymer substrate to form electrodes on said polymer substrate for contacting said tissue, patterning conducting lines on said polymer substrate, and

implementing final processing steps on said polymer substrate.

33. The method of processing an electrode array of claim 32, wherein said conductive material is biocompatable.

34. The method of processing an electrode array of claim 32, wherein said conductive material is implantable.

35. The method of processing an electrode array of claim 32, wherein said conductive material is gold or platinum.

36. The method of processing an electrode array of claim 32, wherein said polymer is an elastomer.

37. The method of processing an electrode array of claim 32, wherein said polymer is an elastomer that is flexible.

38. The method of processing an electrode array of claim 32, wherein said polymer is an elastomer that is flexible and stretchable.

39. The method of processing an electrode array of claim 32, wherein said elastomer is poly(dimethylsiloxane).

40. A system of fabricating a flexible electrode array, comprising the steps of:

spin-coating a PDMS layer onto a handle wafer that has been pre-coated with a conductive seed layer,

patterning said PDMS to expose said conductive seed layer to form electrodes,

plating said electrodes slightly higher than the thickness of said PDMS until said electrodes form slight mushroom caps which later will prevent said electrodes from popping out of said PDMS when said PDMS is removed from said handle wafer, and

patterning conducing lines on said PDMS.

41. The system of fabricating a flexible electrode array of claim 40, wherein said step of patterning conducing lines on said PDMS is conducted using thin film deposition.

42. The system of fabricating a flexible electrode array of claim 40, wherein said step of patterning conducing lines on said PDMS is conducted using photolithography.

43. The system of fabricating a flexible electrode array of claim 40, wherein said step of patterning conducing lines on said PDMS is conducted using shadow masking.

44. The system of fabricating a flexible electrode array of claim 40,

including the step of directly embeding an electrical connector into the device to interface with electronics.

45. The system of fabricating a flexible electrode array of claim 40, including the step of casting a PDMS capping layer to said PDMS.

46. The system of fabricating a flexible electrode array of claim 40, including the step of bonding a PDMS capping layer to said PDMS.

47. The system of fabricating a flexible electrode array of claim 40, wherein said conductive seed layer is biocompatible.

48. The system of fabricating a flexible electrode array of claim 40, wherein said conductive seed layer is gold.

49. The system of fabricating a flexible electrode array of claim 40, wherein said conductive seed layer is platinum.

50. The system of fabricating a flexible electrode array of claim 40, wherein said conductive seed layer is a conductive polymer material.

51. The system of fabricating a flexible electrode array of claim 40, wherein a pre-patterned or formed PDMS layer is bonded to the handle wafer.

52. The system of fabricating a flexible electrode array of claim 40, wherein a pre-patterned or formed PDMS layer is cast in place with a mold

53. The system of fabricating a flexible electrode array of claim 40, wherein gold electrodes are electroplated onto said conductive seed layer.

54. The system of fabricating a flexible electrode array of claim 40, wherein platinum electrodes are electroplated onto said conductive seed layer.

55. The system of fabricating a flexible electrode array of claim 40, including the step of directly embedding an integrated circuit into the device such that it interfaces with the electrode array.

56. The system of fabricating a flexible electrode array of claim 40, including the step of spinning on a PDMS capping layer to said PDMS.